California Energy Commission
Public Interest Energy Research (PIER) Program
TRANSPORTATION ENERGY RESEARCH

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The Advanced Natural Gas Vehicle Fuel Tank Project

April 2011

Fact Sheet

The Issue

The transportation sector, responsible for nearly 40 percent of California's greenhouse gas emissions, is a major contributor to global warming. Alternative fuels play an important role in reducing greenhouse gas emissions. Currently, natural gas vehicles are less competitive in the market compared to conventional diesel and gasoline vehicles. Limited driving range, storage capacity, and weight of conventional tanks continue to be barriers to increasing the use of natural gas as an alternative transportation fuel in California. In addition, natural gas storage options are expensive in terms of both vehicles and fueling stations.

Project Description

This research will develop a replacement for the bulky cylindrical, heavy-walled compressed natural gas tanks currently used in natural gas vehicles. The tank will have a storage capacity that meets the U.S. Department of Energy target: *180 times more gas per volume than under standard temperature and pressure conditions*.

The replacement tank will be a flat, solid-state, lightweight tank that stores natural gas in adsorbed form. Carbon-activated briquettes, manufactured from spent corn cobs, which are low cost and widely commercially available, will be used inside the tank to absorb the natural gas.

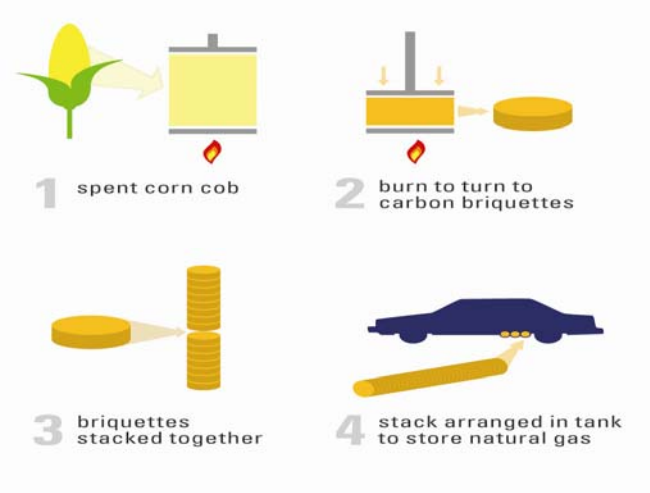

Image Credit: California Energy Commission

This development will lay the foundation for the commercialization of low-cost, low-pressure, flat panel natural gas storage tanks in vehicles and at fueling stations.

PIER Program Objectives and Anticipated Benefits for California

The flat design made possible by the on-board tank's low pressure will enable the tank to be mounted under the floor or in another unused space in a car, instead of taking up a large portion of the trunk. At target costs, the tank will give light-duty natural gas vehicles a driving range of 300 miles, without taking up any trunk or passenger space, and will weigh an estimated half as much as the current 200-mile compressed natural gas tanks. The

reduced weight will further increase vehicle efficiency and reduce gas consumption while making natural gas vehicles a more attractive consumer choice. The low-pressure design will also reduce fueling-station costs—both public stations and home fueling appliances—by significantly reducing the energy needed for compression.

Project Specifics

Contract Number: 500-08-022
Contractor: University of Missouri, Columbia
Application: Nationwide
Contract Amount: $1 million
Contract Term: May 2009 to November 2011
Co-funding: $307,584 from the University of Missouri; $310,068 from the Southern California Gas Company

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